2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the proposed action and alternatives for the SR-262 Montezuma Creek to Aneth, Utah, project. As described in Chapter 1, the purpose of the project is to improve safety, correct roadway deficiencies, and reduce the potential for conflicts between the traveling public, pedestrians and animals. This determination was based on the identified needs for SR-162 and the intersections of SR-162 and SR-262 in Montezuma Creek. In accordance with the guidelines in the FHWA Technical Advisory T 6640.8a, the No Action (No Build), Transit, Transportation System Management (TSM), and Build alternatives are evaluated in this DEIS.

A project team that included representatives from the FHWA, the Navajo Department of Transportation (Navajo DOT), and UDOT directed the development and evaluation of alternatives. Representatives of the project team met regularly from the project start in winter 2005 to winter 2007 to develop the project alternatives and the methodology for assessing potential impacts in the DEIS.

In addition to continued involvement of FHWA, Navajo DOT, and UDOT, the general public has also been involved in the alternatives development process. Through public information meetings, legal notices, a project web site, and public letters/comments, the public has had the opportunity to learn about and provide input relating to the proposed action and alternatives. A list of meetings held as part of the public involvement process for this project is included in Chapter 6. In addition, there has been ongoing coordination with resource and regulatory agencies, and other federally recognized Indian Tribes to identify critical corridor issues and develop concepts that would meet agency standards. Comments from the public and the resource and regulatory agencies have been incorporated into the alternatives development and evaluation process.

2.1 PROPOSED ACTION

FHWA, Navajo DOT and UDOT are proposing improvements along an 8.5-mile stretch of SR-162 from Montezuma Creek to Aneth in San Juan County, Utah (**Figure 1.1**). The highway improvements would connect to previously completed safety improvements east of Aneth. The proposed action also includes improvements to the intersection of SR-162 and SR-262 in Montezuma Creek. The focus of the project is to improve overall safety along the highway corridor by correcting roadway deficiencies and reducing potential conflicts with pedestrians and grazing animals. To satisfy current and expected functional needs for SR-162 between Montezuma Creek and Aneth, the roadway needs to be updated to meet current AASHTO and UDOT roadway and safety standards.

2.2 INDEPENDENT UTILITY AND LOGICAL TERMINI

Federal law (23 CFR 771.111(f)) requires that each transportation project evaluated in a NEPA document:

- Connect logical termini and be of sufficient length to address environmental matters on a broad scope
- Have independent utility or independent significance

- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements

The logical termini of the proposed action are approximately 0.5 mile west of the intersection of SR-162 and SR-262 in Montezuma Creek on the west, and approximately 0.5 mile east of Aneth on the east. These are logical termini because of the previous improvements on the east, and because the intersection allows independent utility. That is the improvements to the intersection would be usable and be a reasonable expenditure even if no additional transportation improvements were done in the area.

2.3 ALTERNATIVES CARRIED FORWARD FOR ANALYSIS

Based on the Purpose and Need for the project, a reasonable range of safety improvements were considered. These safety improvements were combined into two groups of alternatives. The alternatives developed by the project team are described in the following sections. The alternatives discussed below will be carried through the document for further analysis. Alternatives considered but eliminated from analysis in this document are discussed in Section 2.4.

The first group of alternatives focuses on improvements to the intersection of SR-162, SR-262, and CR 450 in Montezuma Creek, Utah. An overview of the current intersection alignments is presented in **Figure 2.1**. There are currently two intersections located approximately 200 feet apart: the intersection of SR-262 and SR-162, and the intersection of SR-162 and CR 450. Under current standards, the distance between the intersections is inadequate and creates the potential for driver confusion and traffic backup into the main travel lanes of SR-162. There are three Intersection Build alternatives designated as Intersection Alternatives A, B, and C. The fourth intersection alternative is the No Action alternative. The four intersection alternatives are described in further detail below.

The second group of project alternatives focuses on the roadway alignment and design of SR-162 between the towns of Montezuma Creek and Aneth, Utah. These alternatives start at the approximate point where the intersection alternatives end in Montezuma Creek and continue to approximately 0.5 mile east of Aneth, where they connect with a section of SR-162 that was previously renovated. The two Highway Build alternatives are designated as Alternative One and Alternative Two. The third alternative is the No Action alternative. The three highway alternatives are described in greater detail in the following sections.

Figure 2.1 - Existing Roads at the Intersections in Montezuma Creek

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2.3.1 Intersection Alternatives

2.3.1.1 Build Alternatives

The three Intersection Build alternatives have several features in common. All three alternatives would eliminate the two closely spaced intersections in Montezuma Creek to create one intersection. The new intersection would provide for free-flowing (i.e., no stop signs) movement of the eastbound and westbound traffic on SR-162, while northbound (SR-262) and southbound (CR 450) traffic would be required to stop.

Improvements for all Intersection Build alternatives would include:

- Widening the northbound and westbound lanes at the intersection from one lane to three lanes. Refer to **Figure 2.2a** for an overview of the existing intersection lane configuration and **Figure 2.2b** for an overview of the proposed intersection lane configuration. The new lane configuration on the northbound and westbound legs would consist of a through lane where traffic continues through the intersection without turning, a left-turn lane, and a right-turn lane. All lanes would be 12 feet wide.
- Widening the southbound and eastbound approaches of the intersection to two lanes. Refer to **Figures 2.2a** and **2.2b** for an overview of the existing intersection layout and the proposed intersection layout. The proposed lane configuration on the southbound and eastbound legs would consist of one shared lane to accommodate through traffic and right-turn traffic, and one lane would be for left turns. These lanes would be 12 feet wide.
- A 10-foot shoulder, consisting of a 6-foot paved shoulder and a 4-foot unpaved shoulder is proposed where curb, gutter, and sidewalk are not installed. The roadway would then transition to a 6-foot paved shoulder, at least a 2.5-foot wide curb and gutter, and 6-foot sidewalk, on all sides of the intersection. (Refer to **Figures 2.3 – 2.5** at the end of Chapter 2).
- New pedestrian crossings will be added at the intersection.
- A 10-foot paved shoulder would be added on the south side of the road just in front of the Montezuma Creek Elementary School. This shoulder is proposed to accommodate buses turning right into the elementary school from northbound CR 450 or left from southbound SR-162.
- Replacement of any existing sidewalks or walkways impacted by the project.
- Maintaining all accesses and driveway approaches.

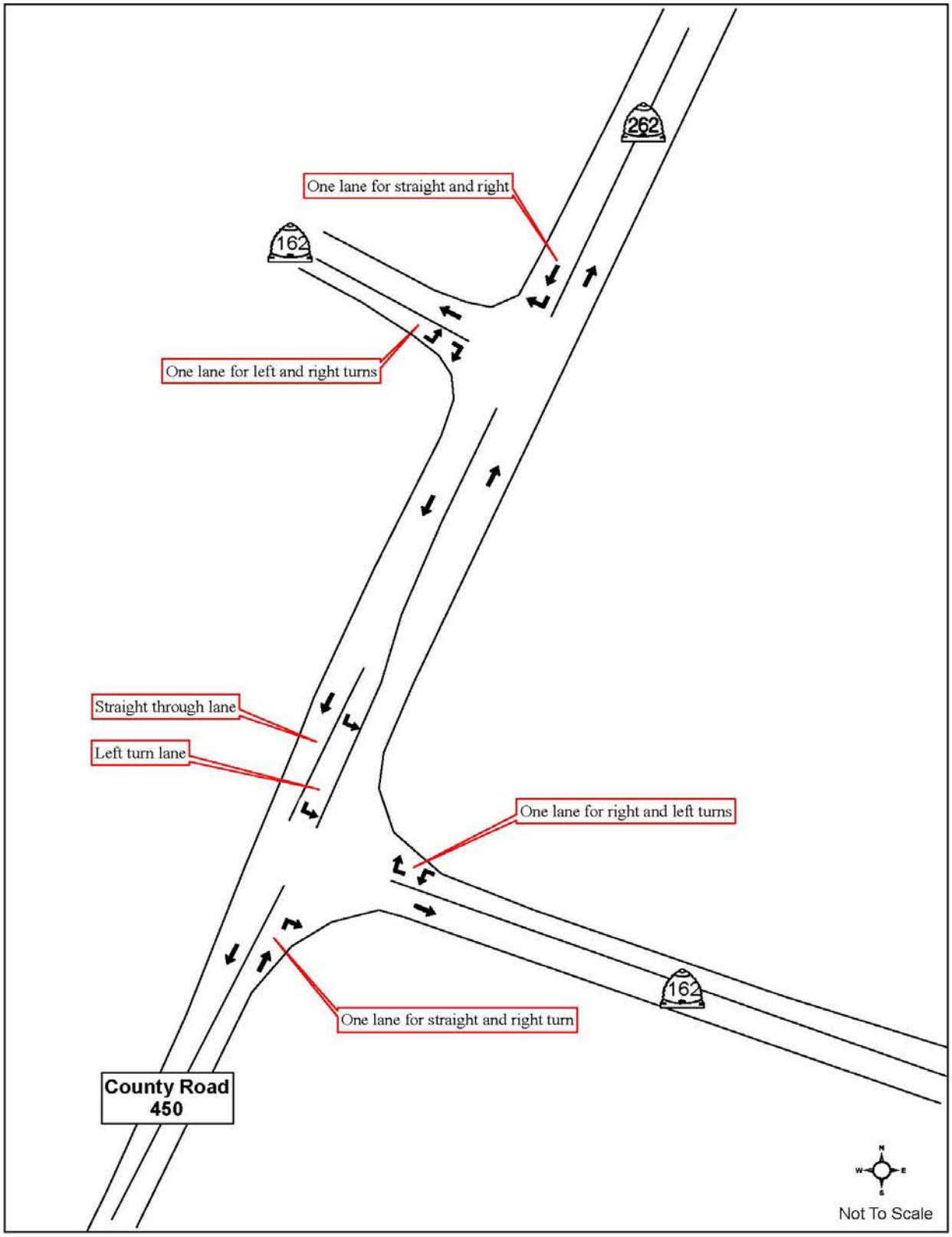

Figure 2.2a - Existing Intersection Layout, Including Lane Configuration

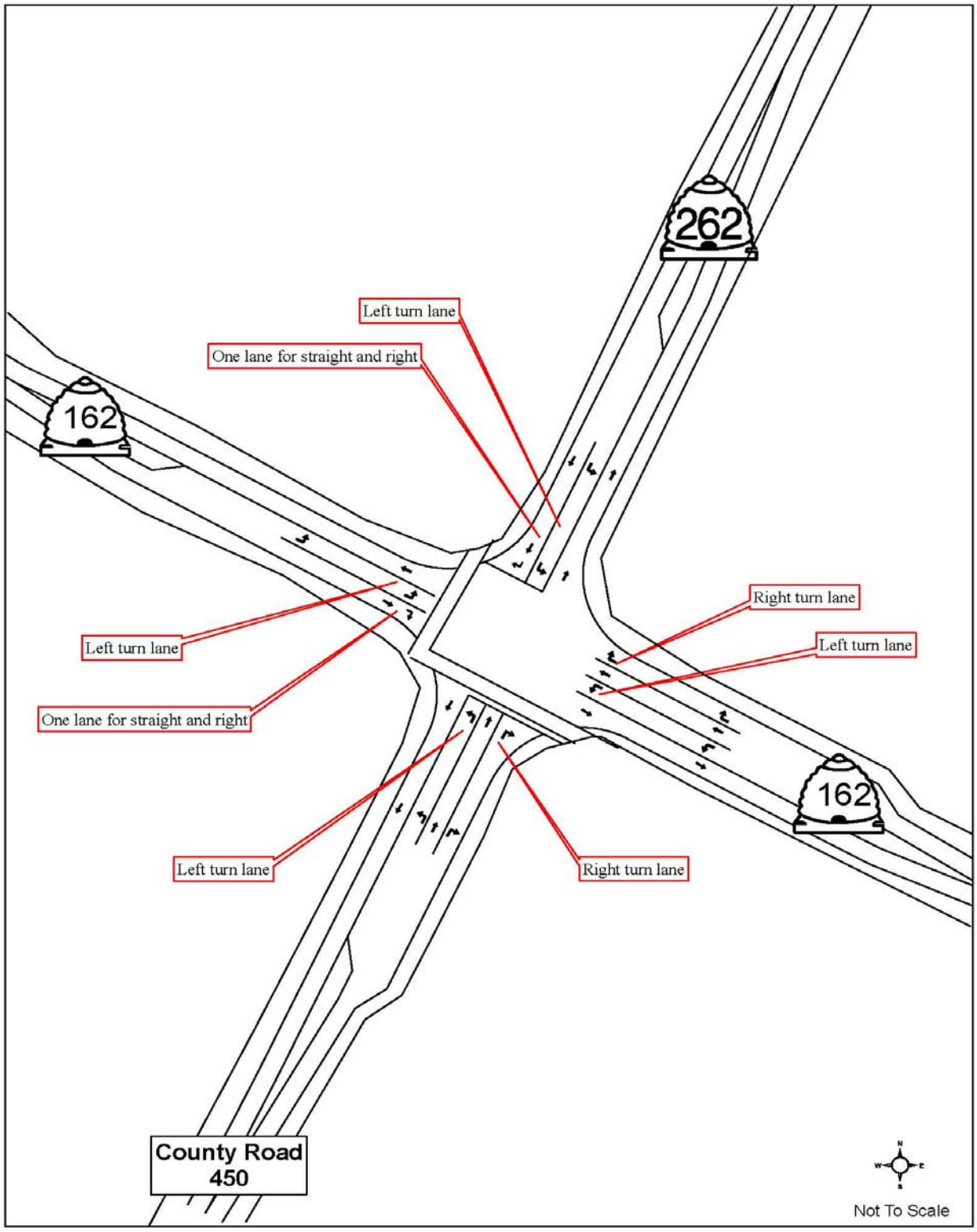

Figure 2.2b - Proposed Intersection Layout, Including Lane Configuration

All of the Intersection Build alternatives would meet UDOT standards and AASHTO guidelines including:

- Intersection alignment; as near to perpendicular as possible
- Turn lane lengths
- Turn lane side slopes (the slopes from the pavement to the ground on the sides of the road)
- Shoulder widths
- Location and use of signing and pavement markings

The following sections describe the Intersection Build alternatives in more detail.

Intersection Alternative A - Intersection Alternative A would realign the roadways of both the east and west approaches. The center of the newly aligned single intersection would be located approximately 87 feet north of the existing SR-162/CR 450 intersection (see **Figure 2.3** at the end of Chapter 2). The west approach of SR-162 would be curved south to connect to the existing east approach of SR-162. A long curve on the east approach would be used to tie the two sections together. The new intersection would be at a slight angle to its existing north-south alignment.

Intersection Alternative B - Under Intersection Alternative B, the new intersection would be located at the current location of the SR-162/SR-262 intersection. It would retain the existing west approach of SR-162 while realigning the east approach to allow for the free-flow movement of eastbound and westbound traffic (see **Figure 2.4** at the end of Chapter 2). This alternative would set the north-south and east-west alignments at exactly 90 degrees (perpendicular) to one another.

Intersection Alternative B would move the intersection, currently near the Montezuma Creek Elementary School, to a location 140 feet to the north and farther away from the school. As a result, the roadway would also be farther away from the school. The entrance and exit driveways, to the school, would be extended to meet the new roadway alignment. East of the intersection, the roadway curve would be realigned to allow for the transition of the existing roadway to the new intersection.

Intersection Alternative C - Under Intersection Alternative C, the new intersection would be located at the current location of the SR-162/CR 450 intersection and focuses primarily on realignment of the roadway west of the intersection. As with Intersection Alternative B, the roadway curve west of the intersection would be realigned to allow for the transition of the new roadway to the existing roadway. The intersection of the north-south and east-west roadways would be perpendicular (see **Figure 2.5** at the end of Chapter 2).

2.3.1.2 No Action Alternative

Under the No Action alternative the intersections of SR-162, SR-262 and CR 450 in Montezuma Creek would remain in their current location. Standard maintenance would continue, but there would be no additional improvements to the two existing intersections.

The No Action alternative does not meet the proposed project's Purpose and Need because the existing intersections are too close to one another and create safety problems for motorists. Although the No Action alternative does not meet the project's Purpose and Need, it will be carried forward for evaluation in this EIS for impact comparison pursuant to the requirements of NEPA (40 CFR 1502.14).

2.3.2 SR-162 Highway Alternatives

2.3.2.1 Build Alternatives

Both of the Highway Build alternatives address several deficiencies:

- Insufficient clear zones (the distance from the edge of the travel way to the nearest potential hazard)
- Insufficient areas for vehicles to safely pull off the road as well as make left turns
- Drainage culverts that do not function adequately
- Lack of school bus pullouts
- Potential vehicle conflicts with grazing animals
- Insufficient shoulder widths

Both alternatives propose the following improvements and updates to address the needs listed above:

- Widen shoulders widened to 10 feet, 6 feet paved and 4 feet unpaved
- In the areas where left turn traffic volumes are high (five or more vehicles per hour) and could cause potential rear-end or head-on collisions, provide a full 10-foot paved shoulder in accordance with UDOT Standard Drawing DD15A1 and to be consistent with what UDOT has been doing in other similar rural locations
- Provide retaining walls, barriers and rockfall protection primarily where the corridor width is restricted by cliffs on the north side of the road or the San Juan River to the south

The following sections describe the Highway Build alternatives in greater detail. **Figure 2.6** (at the end of Chapter 2) is an index figure for **Figures 2.7** through **2.41** (also located at the end of Chapter 2). The index figure shows where each figure, or map sheet (1-35), is located along the project corridor. **Figures 2.7** through **2.41** have a corresponding sheet number located in the bottom right hand corner for reference. Reference points have been added to each of these figures to help orient the reader. Mileposts are also shown on the maps.

Alternative One - Alternative One would maintain the existing roadway alignment, but widen the roadway from approximately 26 feet to 44 feet (see **Figures 2.6** through **2.41**). The existing 12-foot travel lanes would be maintained. However, a wider shoulder would be added to improve safety. Alternative One would remain within the existing right of way (ROW).

The clear zone would also be improved by re-grading or protecting steep side slopes as the existing conditions potentially restrict vehicle recovery. The vertical alignment of the highway

would be adjusted to improve roadway drainage by increasing the grade, or slope, of the roadway in selected areas. The vertical alignment refers to the elevation of the roadway surface. Planned improvements under Alternative One include:

- Total roadway widened to 44 feet
- Shoulder widths would be 10 feet
- Clear zone would vary from 12 feet to 26 feet depending on posted speed limit
- Intersection sight distance would be increased to meet current standards found in Chapter 9 of "AASHTO - Geometric Design of Highways and Streets"
- Several culverts would be replaced and there would be several new culverts installed (refer to **Figures 2.7** through **2.41** for an overview of culvert replacement and addition)
- Crossings would be added for domestic livestock and wildlife; refer to **Figures 2.7** through **2.41** for a location of the new crossing areas

Alternative Two - Alternative Two would also widen the roadway to approximately 44 feet. Alternative Two would consist of relatively minor (20-foot or less) deviations in the horizontal alignment from the existing roadway with the goal of further minimizing encroachments on environmentally sensitive areas (refer to **Figures 2.6** through **2.41**). The horizontal alignment is the location of the roadway from an overhead perspective. For example, the roadway could shift north or south of its current alignment and that would be a horizontal shift. The vertical alignment would be similar to Alternative One, but adjusted in certain locations to minimize impacts to environmentally sensitive areas, rock cliffs, and existing culverts. This would be accomplished by reducing the amount of excavation necessary to provide prescribed shoulder widths and clear zone requirements. The specific shifts in the horizontal alignment, including reference to MPs are shown in **Figure 2.6** and summarized below.

- MP 15.5 – The location of the curve would be moved to the south
- MP 16.5 and MP 17.5 – The location of the curves would be moved to the south
- MP 17.5 – The curve radius would be increased, thus shifting the road alignment to the west
- MP 19 – The curve radius would be increased, thus shifting the road alignment to the west
- MP 22 – The road would be realigned or coordinated to match the proposed alignment of the bridge across McElmo Creek

Alternative Two will require ROW acquisition to accommodate the shifts in the horizontal and vertical alignments.

2.3.2.2 No Action Alternative

Under the No Action alternative, SR-162 between Montezuma Creek and Aneth would remain in its current location. Standard maintenance would continue, but there would be no additional improvements to the roadway. The characteristics of the No Action alternative include:

- The roadway would continue to have narrow shoulders and insufficient clear zones
- Barriers or guardrails would likely be provided in specific areas where shoulder width is insufficient to provide proper distance to barriers

The No Action alternative does not meet the proposed project's Purpose and Need because the existing roadway does not meet current UDOT standards and AASHTO guidelines. Although the No Action alternative does not meet the project's Purpose and Need, it will be carried forward for evaluation in this EIS pursuant to the requirements of NEPA.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

Early in the project design and research process, an alternative was considered that would relocate the highway to an alignment south of the San Juan River. The original intent of the alternative was to avoid sensitive environmental areas along the existing highway alignment. This alternative was eliminated because it would not meet the project's Purpose and Need to address safety and deficiency concerns on SR-162 between Montezuma Creek and Aneth, also it could cause undue environmental impacts to cultural, wildlife, or other resources, and because of the costs of constructing an entirely new road. For these reasons, this alternative was not advanced for further consideration in the NEPA process.

2.5 TRANSPORTATION SYSTEM MANAGEMENT/ TRANSPORTATION DEMAND MANAGEMENT ALTERNATIVE

A Transportation System Management (TSM) alternative seeks to identify improvements to enhance the capability of existing system (roadway) in an operational nature. Through better management and operation of existing transportation facilities, these techniques are designed to improve traffic flow, air quality, and movement of vehicles and goods, as well as enhance system accessibility and safety. A Transportation Demand Management (TDM) alternative seeks to provide a more efficient use of transportation resources.

A TSM or TDM Alternative was not developed for this proposed project because SR-162 is not a major transportation system at this time. Because there are no traffic signals along this section of the road, there would be no benefit to signal coordination, or other improvements to enhance the system or the efficiency of the system.

The success of TDM programs has typically been tied to promotion and support by major employers. No such large employers exist within the SR-162 project study area that would directly affect SR-162.

The Purpose and Need for the Proposed Action is to improve safety and correct roadway deficiencies. A TSM/TDM alternative alone would not meet the Purpose and Need for this project.

2.6 TRANSIT

There is no existing transit system in the project corridor and no foreseeable plans to add transit service. The Purpose and Need of this project is to provide safety improvements, a transit alternative alone would not meet Purpose and Need.

2.7 FUTURE TRANSPORTATION CONDITIONS

Traffic projections provided by UDOT are the basis for determining the future volumes used in the EIS analyses. UDOT projections for the year 2030 indicate AADT of approximately 1,750 vpd, which is an increase of more than 700 vpd. However, under UDOT standards, the existing two-lane configuration of SR-162 would still be adequate to meet projected traffic demand through the year 2030.

2.8 OTHER PROPOSED PROJECTS WITHIN OR NEAR THE STUDY AREA

A number of other transportation projects are proposed for the project study area. Those projects include:

1. McElmo Creek Bridge – The bridge is located just west of Aneth, Utah. The McElmo Creek Bridge is planned for reconstruction by UDOT in either 2008 or 2009. The SR-162 roadway improvement project will be designed to connect to the newly constructed bridge. The McElmo Creek Bridge preliminary design can be seen in **Figures 2.36** and **2.37**. Refer to **Figure 2.42** at the end of Chapter 2 for the location of the project.
2. Highway Lighting in Aneth – A project to add highway lighting along SR-162 in Aneth, Utah, is planned by UDOT to begin in 2008 (refer to **Figure 2.42**).
3. Sidewalks and trails in Montezuma Creek – A project is planned by UDOT and the community of Montezuma Creek to construct pedestrian facilities such as new sidewalks and trails between the Montezuma Creek Elementary School and the Whitehorse High School. The project is planned for 2009 (refer to **Figure 2.43** the end of Chapter 2).
4. Montezuma Creek Bridge over San Juan River – A UDOT bridge rehabilitation project is scheduled to begin in 2008. This bridge is located south of the intersection improvements being proposed in Montezuma Creek (refer to **Figure 2.43**).

2.9 SUMMARY OF ENVIRONMENTAL IMPACTS BY RESOURCE AND BUILD ALTERNATIVE AND SELECTION OF PREFERRED ALTERNATIVES

Table 2.1 below summarizes the impacts to resources by Build Alternative. These impacts will be discussed in further detail in Chapter 3 – Affected Environment and Environmental Consequences and Chapter 4 – Section 4(f) Evaluation.

Table 2.1 – Summary of Environmental Impacts by Resource

Impact Category	Build Alternatives				
	Intersection Alt. A	**Intersection Alt. B**	**Intersection Alt. C**	**Highway Alt. One**	**Highway Alt. Two**
Land Use – Acres converted to Highway use (outside of existing ROW)	3.3	1.8	2.1	15	15
Social Impacts (Distance from the elementary school to SR-162 on the north)	186 feet	484 feet	145 feet	N/A	N/A
Potential Relocations	0	0	0	0	0
Air Quality (Impacts)	No meaningful impacts	No meaningful impacts	No meaningful impacts	No meaningful impacts	No meaningful impacts
Noise Impacts (Exceeds thresholds or No Exceedance)	No Exceedance	No Exceedance	No Exceedance	Not Applicable*	Not Applicable*
Hazardous Materials (# of UST or LUST sites potentially impacted)	0	0	0	2 UST 1 LUST	2 UST 1 LUST
Water Quality	No meaningful impacts	No meaningful impacts	No meaningful impacts	No meaningful impacts	No meaningful impacts
Wetlands – Encroachment in acres	0	0	0	0	0

Table 2.1 – Summary of Environmental Impacts by Resource (cont.)

Impact Category	Build Alternatives				
	Intersection Alt. A	Intersection Alt. B	Intersection Alt. C	Highway Alt. One	Highway Alt. Two
Other Water Features – Drainage channel encroachment (Acres)	0.01	0	0.01	0.861	1.014
Dry Saltcedar/Riparian – Encroachment in Acres	0	0	0	14.64	15.75
Salt Desert Shrubland – Encroachment in Acres	0	0	0	35.76	31.33
Sand Hills – Encroachment in Acres	0	0	0	5.32	6.10
Floodplains – Encroachment in Acres	0	0	0	6.24	7.04
Cultural Resources – Number of sites impacted adversely	0	0	0	7	3
Section 4(f) Eligible Sites – Number of sites impacted (Use – other than *de minimis*)	0	0	0	2	0
Visual Quality – Acres of cliffs/hillsides impacted	0	0	0	3.35	2.06

Source: URS 2008
*This project does not meet Type I project criteria, therefore noise analysis was not conducted (Refer to Section 3.9.1).

Summary **Table 2.1** shows that Intersection Alternative B would move SR-162 further from the elementary school than any other intersection alternative; thus providing the greatest buffer of the school (and the children) from SR-162. Intersection Alternative B would also impact the least amount of acres for new roadway construction and would not require any ROW acquisition

from businesses. For these reasons, Intersection Alternative B has been identified as the Preferred Intersection Alternative.

Based on the Section 4(f) Evaluation (Chapter 4) of the two Highway Build Alternatives, Alternative One would impact two Section 4(f) properties and Alternative Two would not impact any Section 4(f) properties. Because Highway Alternative Two avoids all Section 4(f) properties, it has been identified as the Preferred Highway Alternative.